DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 1.28

WELDING INSPECTION REPORT

Resident Engineer: Casey, William
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-026270
Date Inspected: 09-Sep-2011

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: American Bridge/Fluor Enterprises, a JV

OSM Arrival Time: 700
OSM Departure Time: 1530
Location: Job Site

CWI Name: Bonifacio Daquinag Jr.

Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**CWI Present:**	☑ Yes	☐ No	
Electrode to specification:	☐ Yes	☐ No	☑ N/A	**Rod Oven in Use:**	☐ Yes	☐ No	☑ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☐ Yes	☐ No	☑ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☐ Yes	☐ No	☑ N/A
				Approved WPS:	☑ Yes	☐ No	☐ N/A
				Delayed / Cancelled:	☐ Yes	☑ No	☐ N/A

Bridge No: 34-0006
Component: OBG Sections

Summary of Items Observed:

This Quality Assurance (QA) Inspector, Craig Hager was on site at the job site between the times noted above. This QA Inspector was on site to randomly observe Quality Control (QC) personnel perform Non-Destructive Testing (NDT) and monitor American Bridge/Fluor (ABF) welding operations. This Quality Assurance (QA) Inspector, Craig Hager observed the following.

Self Anchored Suspension (SAS) Tower, Electro Slag Welding (ESW):

This QA Inspector and Lead QA Inspector Danny Reyes had a conversation regarding the Ultrasonic Testing (UT) of the ESW joints, specifically addressing the requirement of QC personnel to record indications observed at "scanning level" which exceeded 50 mm in length. Per AWS D1.5-2002, table 6.4 UT Acceptance-Rejection Criteria – Compressive Stress, General Notes; these indications shall be suspected as being piping porosity and shall be further evaluated by Radiographic Testing (RT).

This QA Inspector was informed by Lead QC Inspector Bonifacio Daquinag Jr. that multiple UT indications had been documented as "NRI" meaning Non Rejected Indications and the intent of the NRI is to document UT indications observed at the scanning level which exceeded 50 mm in length. Lead QC Inspector Bonifacio Daquinag Jr. informed this QA Inspector multiple NRI indications were located at ESW joint location "M" just above the 9-meter diaphragm plate elevation and ESW joint location "V" at Y-550.

The ESW joint at location "M" is a 150° Tee joint and the ESW at location "V" is an 80 mm to 100 mm transition joint. Lead QC Inspector Bonifacio Daquinag Jr. verified the Ultrasonic Testing procedure being used by QC

personnel specifies using a 70 degree shear wave transducer from both faces (A and B) on the intersecting 60 mm thick member for the 150° Tee joint and a 45 degree shearwave transducer form both sides of the weld and form both faces (A and B) for the 80 mm to 100 mm transition joints.

This QA Inspector was then able to determine the applicable scanning levels according to AWS D1.5-2002, table 6. 4 UT Acceptance-Rejection Criteria – Compressive Stress, Scanning Level table for each of the ESW joints as follows.

150° Tee joint using a 70 degree transducer and scanning from the 60 mm plate: the "scanning level" shall be 29 dB greater than the established reference level.

80 mm to 100 mm transition joint using a 45 degree transducer and scanning form each side of the weld (80 mm and 100 mm plates): the scanning level shall be 29 dB greater than the reference level for the 80 mm plate side and 39 dB greater than the reference level for the 100 mm plate side.

This QA Inspector performed a preliminary UT verification as requested on the areas noted below using the UT techniques confirmed by Lead QC Inspector Bonifacio Daquinag Jr. using the scanning levels established by AWS D1.5-2002.

ESW joint location M: This QA Inspector observed on face B of this weld from the 9-meter diaphragm plate elevation and above there appeared to be "NRI" indications marked at: Y-7070, Y-7570 and Y-7705. These areas were marked with the "Y" location, depth and the weld face was marked. At approximately five areas above the Y7705 mark this QA Inspector observed what appeared to be the depth and length of UT indications at Y locations marked on the adjacent base metal, the weld face was not marked, but the lengths appeared to exceed 50 mm. This QA Inspector was able to access and perform UT from approximately Y-6900 to 7800 and observed the following – from Y-7070 plus 185 mm an indication was observed at scanning level but did not appear to exceed the acceptance criteria, from Y-7570 plus 60 mm an indication was observed at scanning level but did not appear to exceed the acceptance criteria and from Y-7705 plus 75 mm this QA Inspector observed what appeared to be a Class B indication for this length, which exceeded the acceptance criteria. The areas with vague markings above this height were not readily accessible at this time. This QA Inspector attempted to perform UT from weld face A, but observed the scanning area was covered with slag from the carbon arc process due to the removal of the strong backs. It appeared this area would require cleaning with a power wire wheel in order to perform QC UT inspections and QA verifications. This QA Inspector informed QC Inspector Steve McConnell of the findings noted above; QC Inspector Steve McConnell stated the UT performed to date was for information purposes only.

ESW joint location V: This QA Inspector had been informed by Lead QC Inspector Bonifacio Daquinag Jr. a "NRI" indication was located at Y-550. This QA Inspector accessed this weld joint form the outside, face A and did not observe any markings at this location. This QA Inspector performed UT from approximately Y-500 to Y-700 and observed an indication at scanning level that did not appear to exceed the acceptance criteria at Y-540 plus 60 mm.

In general it appears QC personnel have started to determine the locations of "Non Rejected Indications" for RT but the marking of these indications do not appear to be as detailed and accurate as indications that have been rejected. This QA Inspector informed Lead QA Inspector Danny Reyes of the observations noted above.

WELDING INSPECTION REPORT

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Summary of Conversations:

This QA Inspector had general conversations with American Bridge/Fluor (ABF) and Caltrans personnel during this shift. Except as described above and noted above there were no notable conversations.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy (510) 385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Hager,Craig	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer